

**MATERIAL SAFETY DATA SHEET****SECTION 1 - IDENTIFICATION**

<b>Product identifier</b>	<b>BULLWHIP 240EC Herbicide</b>	
<b>Product Code(s)</b>	62A/6210	
<b>Product Use</b>	Herbicide	
<b>Chemical Family</b>	Chlorinated herbicide mixture	
<b>Supplier's name and address:</b>	<b>Manufacturer's name and address:</b>	
<b>Cheminova Canada Inc.</b>	<b>Cheminova A/S</b>	
22499 Jefferies Road, Unit C2 Kilworth, ON, Canada N0L 1R0	PO Box 9 DK-7620 Lemvig, Denmark	
<b>Information Telephone #</b>	1-888-316-6260 (Monday - Friday, 8:00 AM - 4:00 PM, Eastern Standard Time)	
<b>24 Hr. Emergency Tel #</b>	For Medical Emergencies: 1-866-303-6950 (613) 996-6666 (CANUTEC)	
<b>Other names:</b>	CLODINAFOP-PROPARGYL 240 g/L EC	

**SECTION 2 - HAZARDS IDENTIFICATION**

<b>Classification</b>	OSHA: This material is classified as hazardous under OSHA regulations (29CFR 1910.1200). Hazardous classification: Acute Health Hazard; Chronic Health Hazard
<b>Emergency Overview</b>	WHMIS information: This product is a Pest Control Product and is not regulated as a Controlled Product under the Hazardous Products Act (HPA). For informational purposes, this product would have the following WHMIS classification: Class D2B (Materials Causing Other Toxic Effects, Toxic Material) Light brown to yellow aromatic liquid. WARNING! Irritating to eyes. May cause slight irritation by other routes of exposure. May be harmful if swallowed. May cause sensitization by inhalation and skin contact. Toxic to aquatic organisms.

**POTENTIAL HEALTH EFFECTS:****Signs and symptoms of short-term (acute) exposure**

<i>Inhalation</i>	May cause respiratory irritation. Symptoms may include coughing, shortness of breath, wheezing and reduced lung function.
<i>Skin</i>	May cause mild skin irritation on prolonged contact.
<i>Eyes</i>	Can cause irritation, redness, tearing, and blurred vision and/or eye damage.
<i>Ingestion</i>	Harmful if swallowed. May cause irritation of mouth, throat, and stomach. Difficulty breathing and sedation may occur. Product may present an aspiration hazard, if ingested in large amounts, causing life-threatening lung injury.

**Effects of long-term (chronic) exposure**

<b>Carcinogenic status</b>	Possible sensitizer. Animal testing indicates liver damage may occur. See TOXICOLOGICAL INFORMATION, Section 11.
<b>Additional health hazards</b>	See TOXICOLOGICAL INFORMATION, Section 11. Possible sensitizer.
<b>Potential environmental effects</b>	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. See ECOLOGICAL INFORMATION, Section 12.

**MATERIAL SAFETY DATA SHEET****SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS**

<b>Ingredients</b>	<b>CAS #</b>	<b>Wt.%</b>
Clodinafop-propargyl	105512-06-9	20.00 - 40.00
Solvent naphtha (petroleum) heavy aromatic (Solvesso 200 ND)	64742-94-5	30.00 - 60.00
gamma-Butyrolactone	96-48-0	7.00 - 15.00
Acetic acid, [(5-chloro-8-quinolinyl)oxy-], 1-methyl hexyl ester	99607-70-2	3.00 - 7.00
Calcium dodecylbenzene sulfonate	26264-06-2	1.00 - 5.00
2-Ethylhexanol	104-76-7	1.00 - 5.00
Alcohol ethoxylate propoxylate	N/Av	3.00 - 7.00

**SECTION 4 - FIRST AID MEASURES**

<b>Inhalation</b>	Immediately remove person to fresh air. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing has stopped, give artificial respiration. Seek immediate medical attention/advice.
<b>Skin contact</b>	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If irritation persists, seek prompt medical attention. Wash contaminated clothing before re-use.
<b>Eye contact</b>	Flush immediately with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. After initial flushing, remove any contact lenses if worn, and continue flushing for at least 5 to 10 minutes. Get medical attention.
<b>Ingestion</b>	Do NOT induce vomiting. Have victim rinse mouth with water, then give one to two glasses of water to drink. Never give anything by mouth to an unconscious person. Seek immediate medical attention/advice.
<b>Notes For Physician</b>	Treat symptomatically. There is no specific antidote available. Material is an aspiration hazard. Gastric lavage or administration of activated charcoal can be considered.

**SECTION 5 - FIRE FIGHTING MEASURES****Fire hazards/conditions of flammability**

Not flammable under normal conditions of use. However, may ignite if exposed to extreme heat and flame. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure.

**Flammability classification (OSHA 29 CFR 1910.1200)**

OSHA Combustible IIIB

**Oxidizing properties**

None

**Explosion data: Sensitivity to mechanical impact / static discharge**

May be sensitive to static discharge. Not expected to be sensitive to mechanical impact.

**Suitable extinguishing media**

Dry chemical or carbon dioxide for small fires; water spray or foam for large fires. Use water spray to cool unopened containers.

**Special fire-fighting procedures/equipment**

Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame. Avoid spreading burning liquid with water spray used for cooling purposes. Approach the fire from upwind to avoid hazardous vapours and toxic decomposition products.

## MATERIAL SAFETY DATA SHEET

**Hazardous combustion products**

The essential combustion products are volatile, toxic, irritant and flammable compounds. These include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrogen chloride, hydrogen fluoride and various organic chlorinated and fluorinated compounds.

**NFPA Rating**                      0 - Minimal      1 - Slight      2 - Moderate      3 - Serious      4 - Severe  
*Health: 1      Flammability: 1      Instability: 0      Special Hazards: --*

### SECTION 6 - ACCIDENTAL RELEASE MEASURES

**Personal precautions**                      Restrict access to area until completion of clean-up. All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment.

**Environmental precautions**                      Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers, or any natural waterway or drinking supply.

**Spill response/cleanup**                      Remove all sources of ignition. Stop spill or leak at source if safely possible. For large spills, dike the area to prevent spreading. Absorb spill with absorbent such as hydrated lime, universal absorbent, Fuller's earth or other absorbent clay. Collect the contaminated absorbent. Transfer to suitable containers. Rinse area with solution of lye and water. Prevent runoff from entering surface water drains. Large spills which soak into the ground should be dug up and transferred to suitable containers.

**Prohibited materials**                      None known.

**Special spill response procedures**                      In case of a transportation accident, in the United States contact CHEMTREC at 1-800-424-9300 or International at 1-703-527-3887.

### SECTION 7 - HANDLING AND STORAGE

**Safe Handling procedures**                      Wear chemically resistant protective equipment during handling. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Do not breathe vapours/dust. Keep away from heat and flame. Avoid contact with incompatible materials. Use caution when opening cap. Keep containers tightly closed when not in use. Wash thoroughly after handling. Avoid dust cloud formation. \*For use as a pesticide, first look for precautions and person protection measures on the label of the packaging. Otherwise, look for official guidance or policies.

**Storage requirements**                      Store in a cool, dry, well-ventilated area. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking in the area. Keep away from food, drink and animal feeding stuffs. Avoid fire or extreme heat.

**Incompatible materials**                      Slightly reactive or incompatible with the following materials: acids and alkalis.

**Special packaging materials**                      Always keep in containers made of the same materials as the supply container.

### SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Exposure Limits**

<u>Ingredients</u>	<u>ACGIH TLV</u>		<u>OSHA PEL</u>	
	<u>TWA</u>	<u>STEL</u>	<u>PEL</u>	<u>STEL</u>
Clodinafop-propargyl	N/Av	N/Av	N/Av	N/Av
Solvent naphtha (petroleum) heavy aromatic (Solvesso 200 ND)	N/Av	N/Av	500 ppm (as petroleum distillates, naphtha)	N/Av
gamma-Butyrolactone	N/Av	N/Av	N/Av	N/Av
Acetic acid, [(5-chloro-8-quinolinyl)oxy-], 1-methyl hexyl ester	N/Av	N/Av	N/Av	N/Av
Calcium dodecylbenzene sulfonate	N/Av	N/Av	N/Av	N/Av
2-Ethylhexanol	N/Av	N/Av	N/Av	N/Av
Alcohol ethoxylate propoxylate	N/Av	N/Av	N/Av	N/Av

## MATERIAL SAFETY DATA SHEET

When used in a closed system, personal protective equipment should not be required. Equipment recommendations are for other situations.

### Ventilation and engineering measures

Use general or local exhaust ventilation to maintain air concentrations below recommended exposure limits.

### Respiratory protection

Respiratory protection is required if the concentrations exceed the TLV. NIOSH-approved respirators are recommended. Seek advice from respiratory protection specialists.

### Skin protection

Impervious gloves must be worn when using this product. Advice should be sought from glove suppliers.

### Eye / face protection

Safety glasses with side-shields or chemical splash goggles.

### Other protective equipment

Wear resistant clothing and boots. An eyewash station and safety shower should be made available in the immediate working area.

### General hygiene considerations

Avoid breathing vapors, fumes or dust. Avoid contact with skin, eyes and clothing. Do not eat, drink, smoke or use cosmetics while working with this product. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse. Do not take contaminated clothing home.

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state</b>	Liquid.	<b>Appearance</b>	Light brown to yellow liquid.
<b>Odour</b>	Aromatic.	<b>Odour threshold</b>	N/Ap
<b>pH</b>	7.14 at 25 °C, 1% dispersion in water: 5.61 at 25 °C	<b>Specific gravity</b>	1.08 @ 20 °C
<b>Boiling point</b>	Not available.	<b>Coefficient of water/oil distribution</b>	Log Kow = 3.90 @ 25 °C (for clodinafop-propargyl)
<b>Melting point</b>	Not available	<b>Solubility in water</b>	4.0 mg/L at 25 °C
<b>Vapour pressure (mmHg @ 20° C / 68° F)</b>	2.4 x 10 <sup>-8</sup> mm Hg @ 25°C (Clodinafop-propargyl); 0.1 mm Hg @ 20°C, 0.6 mm Hg @ 55°C (Solvesso 200 ND)	<b>Evaporation rate (n-Butyl acetate = 1)</b>	Not applicable.
<b>Vapour density (Air = 1)</b>	N/Av	<b>Volatiles (% by weight)</b>	Not applicable.
<b>Volatile organic Compounds (VOCs)</b>	Not applicable.	<b>Auto-ignition temperature</b>	>400 °C
<b>Flash point</b>	95 °C	<b>Upper flammable limit (% by vol.)</b>	7% (Solvesso 200 ND)
<b>Flash point Method</b>	N/Ap	<b>Flashback observed</b>	N/Ap
<b>Lower flammable limit (% by vol.)</b>	0.6% (Solvesso 200 ND)		
<b>Flame Projection Length</b>	N/Ap		
<b>Viscosity</b>	Not applicable.		
<b>Absolute pressure of container</b>	Not applicable.		
<b>Solubility in organic solvents</b>	Solubility of Clodinafop-propargyl at 25°C in:		
	acetone	880 g/L	
	ethanol	97 g/L	
	toluene	690 g/L	
	n-octanol	25 g/L	
	n-hexane	8.6 g/L	

## MATERIAL SAFETY DATA SHEET

### SECTION 10: STABILITY AND REACTIVITY

<b>Stability and reactivity</b>	Stable under the recommended storage and handling conditions prescribed.
<b>Hazardous polymerization</b>	Will not occur.
<b>Conditions to avoid</b>	Keep this product away from heat, sparks, flame, and other sources of ignition (e.g. pilot lights, electric motors, static electricity).
<b>Materials To Avoid And Incompatibility</b>	Strong acids and alkalis.
<b>Hazardous decomposition products</b>	None known, refer to hazardous combustion products in Section 5.

### SECTION 11 - TOXICOLOGICAL INFORMATION

<b>Target organs</b>	Eyes, skin, respiratory system, digestive system, central nervous system. Liver and kidney injuries may occur.
<b>Routes of exposure</b>	<i>Inhalation:</i> YES <i>Skin Absorption:</i> NO <i>Skin &amp; Eyes:</i> YES <i>Ingestion:</i> YES
<b>Toxicological data</b>	No additional information.

<b>Ingredients</b>	<b>LC<sub>50</sub> (4hr)</b>	<b>LD<sub>50</sub></b>	
	<b>inh, rat</b>	<b>(Oral, rat)</b>	<b>(Rat, dermal)</b>
Clodinafop-propargyl	> 2.3 mg/L/4h	1392 mg/kg (rat, male). 2271 mg/kg (rat, female)	>2000 mg/kg (rat)
Solvent naphtha (petroleum) heavy aromatic (Solvesso 200 ND)	>590 mg/m <sup>3</sup>	N/Av	>2 mL/kg
gamma-Butyrolactone	>2.68 mg/L 4 h	1540 mg/kg	N/Av
Acetic acid, [(5-chloro-8-quinolinyloxy-), 1-methyl hexyl ester	N/Av	N/Av	N/Av
Calcium dodecylbenzene sulfonate	N/Av	4 g/kg	N/Av
2-Ethylhexanol	890 - 5300 mg/m <sup>3</sup>	2052 mg/kg	1985 mg/kg
Alcohol ethoxylate Propoxylate	N/Av	N/Av	N/Av

**For the product as a whole :**

LD<sub>50</sub>, oral, rat: > 3000 mg/kg  
 LD<sub>50</sub>, dermal, rat: > 2000 mg/kg  
 LC<sub>50</sub>, inhalation, rat: > 3.5 mg/L/4 h

**Carcinogenic status** No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.

**Reproductive effects** Not expected to have other reproductive effects.

**Teratogenicity** Not expected to be a teratogen.

**Mutagenicity** Not expected to be mutagenic in humans.

**Epidemiology** Not available.

**Sensitization to material** May cause sensitization of susceptible persons. The Magnusson-Kligman test was positive.

**Synergistic materials** Not available.

**Irritancy** Irritating to eyes. Mild skin irritant. May cause respiratory irritation.

**Other important hazards** Aspiration hazard - material may cause lung inflammation or damage if it enters lungs through vomiting or swallowing. Serious liver damage was found in animal testing at exposure levels of 8 mg/kg bw/day.

### MATERIAL SAFETY DATA SHEET

**Conditions aggravated by overexposure**

Pre-existing skin, eye, respiratory and central nervous system disorders.

This product is not considered to be harmful by ingestion, inhalation or contact with skin. However, it should always be treated with the usual caution when handling chemicals.

#### SECTION 12 - ECOLOGICAL INFORMATION

**Ecotoxicity**

This product is a specific herbicide against grasses, but other types of green plants can be sensitive as well. The product is toxic to fish and aquatic plants. It is not considered harmful to aquatic invertebrates, birds, soil micro-organisms, larger soil organisms, and insects.

The following values are for Clodinafop propargyl:

Rainbow trout (*Oncorhynchus mykiss*): 0.39 mg/L (96-h LC50), 0.1mg/L 21-day NOEC.

Daphnids (*Daphnia magna*) >0.74 mg/L (48-h EC50); 0.23 mg/L 21-day NOEC.

Green algae (*Scenedesmus subspicatus*): 1.7 mg/L (72-h IC50)

Bobwhite quail (*Colinus virginianus*) 1455mg/kg LD50.

Mallard duck (*Anas platyrhynchos*) >2000 mg/kg LC50.

Earthworms (*Eisentia foetida*): 210 mg/kg dry soil, 14-day LC50.

Honey bee (*Apis mellifera*) >100 µg/bee, contact

Honey bee (*Apis mellifera*) 48-h LD50, oral: > 100 µg/bee

**Mobility**

The active ingredient has low mobility in soil.

**Persistence**

The active ingredient is biodegradable, but does not meet the criteria for being readily biodegradable. Degradation half-lives are found to be less than 1 day in aerobic soil. The solvent Solvesso 200 ND is readily biodegradable per OECD guidelines. It is not always rapidly degraded in the environment, depending on circumstances.

**Bioaccumulation potential**

Due to rapid degradation, the product does not bioaccumulate.

**Other adverse environmental effects**

This product is an herbicide. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters.

#### SECTION 13 - DISPOSAL CONSIDERATIONS


**Handling for Disposal**

Handle waste according to recommendations in Section 7.

**Methods of Disposal**

Do not contaminate water, foodstuffs, feed or seed by storage or disposal. For disposable containers, triple rinse (or equivalent) containers and add rinse material to disposal tank. Follow any additional local, state or federal requirements for cleaning containers prior to disposal. Make the empty, rinsed container unsuitable for further use by puncturing. Material that cannot be reused or chemically reprocessed can be disposed of by methods such as controlled incineration.

#### SECTION 14: TRANSPORT INFORMATION

Regulatory Information	UN Number	Shipping Name	Class	Packing Group	Label
TDG	None	Not regulated.	Not regulated	none	
<b>TDG</b> Additional information	Subject to exemption under TDG section 1.45.1.				

MATERIAL SAFETY DATA SHEET

49CFR/DOT None Not regulated. Not regulated none



49CFR/DOT Not regulated for road or rail shipment if packaged in non-bulk containers (450 L / 119 Gallons or less each).

Additional information

ICAO/IATA UN3082 Environmentally hazardous substance, liquid, n.o.s. (Clodinafop-propargyl) 9 III



ICAO/IATA Refer to ICAO/IATA Packing Instruction Y964 or 964.

Additional information

IMDG UN3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Clodinafop-propargyl) 9 III



IMDG Packing Code: P001, LP01
Additional information Packing Special Provisions: -
IBC Code: IBC03
IBC Special Provision: -
IMO Tank Instructions: T1
UN Tank Instructions: T4
Tank Special Provisions: TP2, TP29

SECTION 15 - REGULATORY INFORMATION

US Federal Information:

OSHA: This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).

SARA TITLE III: Sec. 302, Extremely Hazardous Substances, 40 CFR 355: No Extremely Hazardous Substances are present in this material.

SARA TITLE III: Sec. 311 and 312, MSDS Requirements, 40 CFR 370 Hazard Classes: Immediate (Acute) health hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds for the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 16 - OTHER INFORMATION

HMIS Rating \*- Chronic hazard 0 - Minimal 1 - Slight 2 - Moderate 3 - Serious 4 - Severe
Health: 1\* Flammability: 1 Reactivity: 0

Legend ACGIH: American Conference of Governmental Industrial Hygienists
CA: California
CAS: Chemical Abstract Services
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR: Code of Federal Regulations
DOT: Department of Transportation
EPA: Environmental Protection Agency
HMIS: Hazardous Materials Identification System
HSDB: Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer

**MATERIAL SAFETY DATA SHEET**

Inh: Inhalation  
N/Ap: Not Applicable  
N/Av: Not Available  
NFPA: National Fire Protection Association  
NIOSH: National Institute of Occupational Safety and Health  
NTP: National Toxicology Program  
OSHA: Occupational Safety and Health Administration  
PEL: Permissible exposure limit  
RCRA: Resource Conservation and Recovery Act  
RTECS: Registry of Toxic Effects of Chemical Substances  
SARA: Superfund Amendments and Reauthorization Act  
STEL: Short Term Exposure Limit  
TDG: Canadian Transportation of Dangerous Goods Act & Regulations  
TLV: Threshold Limit Values  
TPQ: Threshold Planning Quantity  
TSCA: Toxic Substance Control Act  
TWA: Time Weighted Average  
WHMIS: Workplace Hazardous Materials Identification System

**References**

1. ACGIH, Threshold Limit Values and Biological Exposure Indices
2. International Agency for Research on Cancer Monographs
3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases (Chempendium, HSDB and RTECs).
4. Material Safety Data Sheets from manufacturer.
5. US EPA Title III List of Lists
6. California Proposition 65 List

**Prepared for:**

Cheminova Canada Inc  
22499 Jefferies Rd, Unit C2  
Kilworth, ON, Canada, N0L 1R0  
Direct all enquiries to: Cheminova Canada,  
1-888-316-6260



**Prepared by:**

ICC The Compliance Center Inc.  
<http://www.thecompliancecenter.com>



**MATERIAL SAFETY DATA SHEET  
DISCLAIMER OF LIABILITY**

This Material Safety Data Sheet was prepared by ICC The Compliance Center Inc. using information provided by / obtained from Cheminova Canada Inc. and CCOHS' Web Information Service. The information in the Material Safety Data Sheet is offered for your consideration and guidance when exposed to this product. ICC The Compliance Center Inc. and Cheminova Canada Inc. expressly disclaim all expressed or implied warranties and assume no responsibilities for the accuracy or completeness of the data contained herein. The data in this MSDS does not apply to use with any other product or in any other process.

This Material Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of ICC The Compliance Center Inc. and Cheminova Canada Inc.

**Preparation Date (mm/dd/yyyy)**

04/20/2012

**END OF DOCUMENT**